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Hydrophobic organosilica coating on steel and aluminium (Article)

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Abstract

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Superhydrophobic organosilica was fabricated from Tetraorthosilicate (TEOS) as the precursor using a simple sol gel technique and treated by using perfluoroalkysilane. The super hydrophobic silica has been coated on steel and aluminium surface and was characterised based on the silica content on the coating. The results show that the highest contact angle achieved is 108 degree and all the coating has more than 90 degree water contact angle. Since the contact angle is lower than 150 degree, it only managed to get hydrophobic surface instead of superhydrophobic surface. The high contact angle is believed due to presence of air pocket between water and solid surface that enhance by the roughness of the coating. In addition, water contact angle and surface roughness step up with increasing silica content in the coating. The water contact angle of the coating surface can be predicted using the following equation WA=89.39+0.975SR for steel and WA=83.20+1.097SR for aluminium substrates, where WA is water contact angle and SR is surface roughness.

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